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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
DHINGRA, RAKESH KUMAR	

ART UNIT	PAPER NUMBER
1763	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/689,783	NGUYEN ET AL.	
	Examiner	Art Unit	
	Rakesh K. Dhingra	1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *03* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 December 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-34* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-34* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *12/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Response to Arguments

Applicant's arguments, see pages 11-18, filed 12/19/05, with respect to the rejection(s) of claim(s) 1-34 under 35 USC 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in respect of claims 1, 13, 24 under 35 USC 102 (b) as anticipated by Stevens et al (US Patent No. 5,632,873), and in respect of claims 13, 24 under 35 USC 103 (a) as being unpatentable over Wang et al (US Patent No. 6,537,011) in view of Stevens et al (US Patent No. 5,632,873) as explained below. Similarly dependent claims 2-12, 14-23, 25-34 have also been rejected as explained below.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

1) Claims 30 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. See MPEP § 2173.05(c). Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to

whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949). In the present instance, claim 30 recites the broad recitation "between about 2 degrees and about 7 degrees", and the claim also recites (2.5 degrees) which is the narrower statement of the range/limitation.

Claim 30 recites the limitation "between 2 degrees and about 7 degrees (2.5 degrees)" where "2.5 degrees within parenthesis" is indefinite. For the purpose of examination on merits this limitation has been interpreted to imply "between 2 degrees and about 7 degrees".

2) Claim 3, 4, 15, 16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 3, 14 recite limitation "one or more raised surfaces are disposed on at least opposing sides of the bore" is indefinite since "one" raised surface can not be disposed on two sides of the bore. For the purpose of examination on merits this limitation has been interpreted as: "two or more raised surfaces are disposed on at least opposing sides of the bore". Claims 4, 16 are similarly rejected being dependent claims.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 5, 9, 12 are rejected under 35 U.S.C. 102 (b) as being anticipated by Stevens et al (US Patent No. 5,632,873).

Regarding Claim 1: Stevens et al teach an apparatus (Figures 1-4) for supporting a substrate, comprising:

an inner (cover) ring 11 (Figure 4) comprising a base 52 having a bore disposed there-through, the base having an upper surface and one or more lips (raised surfaces) 54 disposed adjacent the bore, wherein the raised surface comprise one or more first substrate support members disposed adjacent an edge of the bore; and

an outer (capture) ring 12 disposed on the inner (cover) ring 11, the capture ring comprising semi- circular annular ring portions (in between spaces 46 as per Figure 3) having an inner perimeter corresponding to the bore of the inner (cover) ring 11 and one or more spacers (second substrate support members) 46 disposed on the inner perimeter and adapted to support (receive) a substrate, wherein the outer (capture) ring 12 is adapted to mate with the cover ring 11 (through alignment pins 49) and form one contiguous raised surface on the cover ring (top surface of outer ring 12) [Column 8, line 50 to Column 10, line 65].

Regarding Claim 5: Stevens et al teach that one or more spacers (second substrate support members) 46 of the capture ring are disposed on opposite sides of the inner perimeter of outer (capture ring) 12 [Figure 3].

Regarding Claim 9: Stevens et al teach that inner (cover) ring 11 comprises one or more recesses 51 (Column 10, lines 1-6).

Regarding Claim 12: Stevens et al teach that inner (cover) ring 11 has an inner annular base portion 12 adapted to be received on the substrate support (pedestal) 20 [Column 10, lines 10-15].

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Stevens et al (US Patent No. 5,632,873) in view of Takagi (US Patent No. 6,676,759).

Regarding Claim 2: Stevens et al teach all limitations of the claim including that one or more raised surfaces 54 disposed adjacent the bore comprise a first and second raised surfaces (Figure 4) with the first raised surface comprising a linear raised surface extending a length of one side of the bore.

Stevens et al do not teach second raised surface comprising an arcuate outer diameter radial with the cover ring and an inner perimeter conforming to one or more sides of the bore.

Takagi teaches a wafer support device (Figures 1,2) that uses a susceptor 22 having a groove 30 to support a wafer and a semi-circular (arcuate outer diameter) lift ring 32 with supports (second raised surfaces) 36 to support the wafer when being transported on to the susceptor 22 (Column 3, line 11 to Column 4, line 48).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the outer (capture) ring to have arcuate shape as taught by Takagi in the apparatus of Stevens et al to facilitate easy access of the external robot blade during insertion and retrieval of wafer during the processing of wafers.

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Stevens et al (US Patent No. 5,632,873) in view of Takagi (US Patent No. 6,676,759) as applied to Claim 2 and further in view of Tepman et al (US Patent No. 5,922,133).

Regarding Claim 3: Stevens et al in view of Takagi teach all limitations of the claim including that one or more raised surfaces 54 are disposed on opposite sides of bore.

Stevens et al do not teach rectangular shape of bore.

Tepman et al teach an apparatus (Figure 1) that comprises upper and lower exclusion rings (cover and capture rings) 56, 58 for a substrate support and where substrate could be of other shapes with correspondingly shaped rings, besides circular shape implying that the rings could have rectangular bore (Column 4, lines 25-40).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use cover ring with rectangular bore as taught by Tepman et al in the

apparatus of Stevens et al in view of Takagi to enable use the apparatus for rectangular substrates.

Claims 4, 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stevens et al (US Patent No. 5,632,873) in view of Takagi (US Patent No. 6,676,759) and Tepman et al (US Patent No. 5,922,133) as applied to Claim 3 and further in view of Wang et al (US Patent No. 6,537,011).

Regarding Claim 4: Stevens et al in view of Takagi and Tepman et al teach all limitations of the claim including that first raised surface 54 is disposed substantially on one side of bore and second raised surface is disposed on opposite side.

Stevens et al in view of Takagi and Tepman et al do not teach second raised surface partially disposed on two adjacent edges.

Wang et al teach a substrate processing apparatus (Figures 2, 18, Column 10, lines 1-35) for supporting and processing a substrate 222 that includes:

a lower pedestal 116 comprising a lower mounting plate (base) 119 having an upper body (upper surface) 121 with substrate supports (raised surfaces) 118 partially disposed on two adjacent edges of substrate support portion 121 (Column 6, lines 30-40).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use a support (capture) ring with raised surface disposed on two adjacent edges as taught by Wang et al in the apparatus of Stevens et al in view of Takagi and Tepman et al to provide proper support to substrate when mounted on cover ring.

Regarding Claim 6: Wang et al teach that one or more first and second substrate support members 204 a-d comprise an upper portion 212, a lower portion 216, and at

least a partial tapered portion 214 disposed between the upper portion and lower portion (Wang et al, Figure 5 and Column 6, lines 30-40).

Regarding Claims 7, 8: Wang et al teach that the lower surface 216 has an inclined surface between 2 to 7 degrees (includes 2.5 degrees) [Wang et al, Column 6, lines 44-50].

Claims 10, 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stevens et al (US Patent No. 5,632,873) in view of Wang et al (US Patent No. 6,537,011) and Roderick et al (US Patent No. 6,074,488).

Regarding Claims 10,11: Stevens et al in view of Wang et al teach all limitations of the claim (as explained above) including that the support ring (capture ring) 120 is made from etch resistant material like aluminum oxide (Wang et al - Column 6, lines 53-60). Stevens et al in view of Wang et al do not teach cover ring made of etch resistant material, Aluminium Oxide.

Roderick et al teach an apparatus 200 for supporting a substrate 50 that uses a collar ring (cover ring) 230 for supporting the substrate and is made from Aluminium oxide (Column 8, lines 35-40), that is an etch resistant material as taught by Wang et al (as explained above).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use cover ring made from etch resistant material that is Aluminium oxide, as taught by Roderick et al in the apparatus of Stevens et al in view of Wang et al to provide more durablility of the cover ring in the plasma etch environment.

Claims 13, 17-21, 24, 28-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang et al (US Patent No. 6,537,011) in view of Stevens et al (US Patent No. 5,632,873).

Regarding Claims 13, 24: Wang et al teach a substrate processing apparatus (Figure 18, Column 10, lines 1-35) for supporting and processing a substrate 222 comprising:

transfer chamber 414;

a plurality of processing chambers 412;

having a pedestal 100 in a process chamber 160 defining a processing region and the pedestal (cathode) 100 comprises (Figures 1, 2):

a lower pedestal 116 comprising a lower mounting plate (base) 119 having an upper body (upper surface) 121 with raised surfaces 118 and substrate supporting ridge 125 disposed around the upper body 121;

a support ring (capture ring) 120 disposed on the lower pedestal (cover ring) 116, the support ring (capture ring) comprising a base plate (ring) 202 ring having an opening (inner perimeter) 206 and one or more second substrate support members 204 a-204d around the opening 206 are adapted to receive a substrate, wherein the support ring (capture ring) 120 is adapted to mate with the lower pedestal (cover ring) 116 and form one contiguous raised surface 121 on the cover ring (Column 5, lines 10-65).

loadlock chamber 416 (Figure 18);

substrate handler 300

Wang et al teach a lower pedestal 116 but do not teach cover ring coupled to the support surface, the cover ring comprising a cover ring comprising a base having a bore disposed there-through, the base having an upper surface and one or more raised

surfaces disposed adjacent the bore, wherein the raised surface comprise one or more first substrate support members disposed adjacent an edge of the bore.

Stevens et al teach an apparatus (Figures 1-4) for supporting a substrate, comprising: an inner (cover) ring 11 (Figure 4) comprising a base 52 having a bore disposed there-through, the base having an upper surface and one or more lips (raised surfaces) 54 disposed adjacent the bore, wherein the raised surface comprise one or more first substrate support members disposed adjacent an edge of the bore; and

an outer (capture) ring 12 disposed on the inner (cover) ring 11, the capture ring comprising semi- circular annular ring portions (Figure 3) having an inner perimeter corresponding to the bore of the inner (cover) ring 11 and one or more spacers (second substrate support members) 46 disposed on the inner perimeter and adapted to contact (support) a substrate, wherein the outer (capture) ring 12 is adapted to mate with the cover ring 11 (through alignment pins 49) and form one contiguous raised surface on the cover ring (top surface of outer ring 12) [Column 8, line 50 to Column 10, line 65].

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use a two ring structure having a bore as taught by Stevens et al in the apparatus of Wang et al to minimize particle contamination due to substrate sticking problems (Column 3, lines 1-9).

Regarding Claims 17, 28: Stevens et al teach that one or more spacers (second substrate support members) 46 of the capture ring are disposed on opposite sides of the inner perimeter of outer (capture ring) 12 [Figure 3].

Regarding Claims 18, 29: Wang et al teach that one or more first and second substrate support members 204 a-d comprise an upper portion 212, a lower portion 216, and at

least a partial tapered portion 214 disposed between the upper portion and lower portion (Wang et al, Figure 5 and Column 6, lines 30-40).

Regarding Claims 19, 30: Wang et al teach that the lower surface 216 has an inclined surface between 2 to 7 degrees (includes 2.5 degrees) [Wang et al, Column 6, lines 44-50].

Regarding Claims 20, 31: Wang et al teach that base (pedestal) 110 comprises one or more lift pins 114 for vertically displacing the whole assembly [includes lower pedestal (like cover ring) 116] {Column 5, lines 50-54}.

Regarding Claims 21, 32: Stevens et al teach that inner (cover) ring 11 comprises one or more recesses 51 for receiving pins 49 (Column 10, lines 1-6).

Claims 14, 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang et al (US Patent No. 6,537,011) in view of Stevens et al (US Patent No. 5,632,873) as applied to claim 13 and further in view of Takagi (US Patent No. 6,676,759).

Regarding Claim 2: Wang et al in view of Stevens et al teach all limitations of the claim including that one or more raised surfaces 54 disposed adjacent the bore comprise a first and second raised surfaces (Figure 4) with the first raised surface comprising a linear raised surface extending a length of one side of the bore.

Wang et al in Stevens et al do not teach second raised surface comprising an arcuate outer diameter radial with the cover ring and an inner perimeter conforming to one or more sides of the bore.

Takagi teaches a wafer support device (Figures 1,2) that uses a susceptor 22 having a groove 30 to support a wafer and a semi-circular (arcuate outer diameter) lift ring 32

with supports (second raised surfaces) 36 to support the wafer when being transported on to the susceptor 22 (Column 3, line 11 to Column 4, line 48).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use a capture ring with second raised surfaces and of semi-circular shape as taught by Takagi in the apparatus of Wang et al in view of Stevens et al to facilitate easy access of the external robot blade during insertion and retrieval of wafer during the processing of wafers.

Claims 15, 16, 26, 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang et al (US Patent No. 6,537,011) in view of Stevens et al (US Patent No. 5,632,873) and Takagi (US Patent No. 6,676,759) as applied to Claim 14 and further in view of Tepman et al (US Patent No. 5,922,133).

Regarding Claims 15, 26: Wang et al in view of Stevens et al and Takagi teach all limitations of the claim including that one or more raised surfaces 54 are disposed on opposite sides of bore.

Wang et al in view of Stevens et al and Takagi do not teach rectangular shape of bore.

Tepman et al teach an apparatus (Figure 1) that comprises upper and lower exclusion rings (cover and capture rings) 56, 58 for a substrate support and where substrate could be of other shapes with correspondingly shaped rings, besides circular shape implying that the rings could have rectangular bore (Column 4, lines 25-40).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use cover ring with rectangular bore as taught by Tepman et al in the apparatus of Wang et al in view of Stevens et al and Takagi to enable use the apparatus for rectangular substrates.

Regarding Claims 16, 27: Stevens et al teach all limitations of the claim including that first raised surface 54 is disposed substantially on one side of bore and second raised surface is disposed on opposite side. Further, Wang et al teach a lower pedestal 116 comprising a lower mounting plate (base) 119 having an upper body (upper surface) 121 with raised surfaces 118 partially disposed on two adjacent edges of substrate support portion 121 (Wang et al, Figure 5 and Column 6, lines 30-40).

Claims 22, 23, 33, 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang et al (US Patent No. 6,537,011) in view of Stevens et al (US Patent No. 5,632,873) as applied to Claim 13 and further in view of Roderick et al (US Patent No. 6,074,488).

Regarding Claims 22, 23, 33, 34: Wang et al in view of Stevens et al teach all limitations of the claim including that the support ring (capture ring) 120 is made from etch resistant material like Aluminium oxide (Wang et al - Column 6, lines 53-60).

Wang et al in view of Stevens et al do not teach cover ring made of etch resistant material, Aluminium Oxide.

Roderick et al teach an apparatus 200 for supporting a substrate 50 that uses a collar ring (cover ring) 230 for supporting the substrate and is made from Aluminium oxide (Column 8, lines 35-40) that is an etch resistant material as taught by Wang et al (as explained above).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use cover ring made from etch resistant material that is Aluminium oxide as taught by Roderick et al in the apparatus of Wang et al in view of Wang et al to provide more durability of the cover ring in the plasma etch environment.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rakesh K. Dhingra whose telephone number is (571)-272-5959. The examiner can normally be reached on 8:30 -6:00 (Monday - Friday). If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on (571)-272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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